

VANDERBILT GOLD CORP.

IBLA 92-322

Decided April 19, 1993

Appeal from a decision of the Oregon State Office, Bureau of Land Management, rejecting hardrock prospecting permit application OR 45170 (WASH).

Affirmed as modified.

1. Mineral Lands: Prospecting Permits

The Secretary has discretionary authority to issue mineral prospecting permits when prospecting or exploratory work is necessary to determine the existence or workability of a particular hardrock mineral deposit. It is not appropriate to issue a prospecting permit if there is sufficient data regarding the quality and quantity of a deposit to conclude that only an increase in the price of the commodity would render a deposit workable.

2. Mineral Lands: Prospecting Permits

BLM may reject a prospecting permit if further prospecting or exploratory work would not disclose the existence or workability of a deposit of hardrock mineral. A deposit is considered workable when the value of the commodity is greater than the cost of extracting it. A workability determination is made by examining only those factors directly related to production of the mineral.

3. Administrative Procedure: Hearings--Hearings--Rules of Practice: Appeals: Hearings--Rules of Practice: Hearings

Although the Board has discretionary authority to order a hearing before an Administrative Law Judge pursuant to 43 CFR 4.415, a hearing is necessary only when there is a material issue of fact requiring resolution through the introduction of testimony and other evidence.

## 4. Evidence: Burden of Proof--Mineral Lands: Prospecting Permits

When considering what evidentiary burden should be placed upon BLM in an appeal from a rejection of a prospecting permit application, it is proper to weigh the cost of that burden against the nature of the appellant's interest and the risk that an appellant would be improperly deprived of that interest if the greater burden were not placed on BLM. A prospecting permit applicant holds an expectancy and not an interest in the land and BLM is not required to sustain its workability determinations with the same quantum of evidence needed to sustain a discovery determination under the 1872 Mining Law.

APPEARANCES: Thomas P. Erwin, Esq., Reno, Nevada, for appellant and intervenor, Teck Resources, Inc.; Donald P. Lawton, Esq., Assistant Regional Solicitor, Portland, Oregon, for the Bureau of Land Management.

## OPINION BY ADMINISTRATIVE JUDGE MULLEN

Vanderbilt Gold Corporation (Vanderbilt) has appealed from the February 21, 1992, decision of the Oregon State Office, Bureau of Land Management (BLM), rejecting hardrock prospecting permit application OR 45170 (WASH). Vanderbilt had filed an application for a permit to prospect for copper, molybdenum, gold, silver, and associated minerals on 897.9 acres of acquired lands within portions of secs. 7, 8, 9, 16, 17, 18, 19, and 20, T 10 N., R. 6 E., Willamette Meridian, Washington. This land also lies within the Gifford Pinchot National Forest. By order dated May 26, 1992, Teck Resources, Inc. (Teck), was allowed to intervene. <sup>1/</sup>

[1] The Secretary has been granted discretionary authority to issue mineral prospecting permits and leases. Prospecting permit issuance is authorized only if "prospecting or exploratory work is necessary to determine the existence or workability of a particular hardrock mineral(s)." 43 CFR 3562.1. However, this regulation does not mandate permit issuance whenever available evidence does not indicate that a known deposit is workable. For example, if a known deposit cannot be considered workable because the value of the mineral in place is less than the cost of extracting it, and further prospecting or exploratory work would not result in a significant change in its size or grade, a prospecting permit would not be warranted. Said another way, it would not be appropriate to issue a prospecting permit when sufficient data exists regarding the quality and quantity of a deposit to conclude that only an increase in the price of the commodity would render the deposit workable. Prospecting permits are

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<sup>1/</sup> Teck is the lessee of fee lands adjacent to those described in the permit application from Vanderbilt, and Vanderbilt has granted Teck the "right to obtain an assignment of the prospecting permit upon issuance."

issued to encourage genuine prospecting, and are not a proper vehicle for holding a known subeconomic deposit in anticipation of more favorable economic conditions.

[2] When prospecting or exploratory work is unnecessary to determine the existence or workability of a valuable deposit of a particular hardrock mineral, the land can only be leased through competitive sale. 43 CFR 3564.1. BLM rejected Vanderbilt's application because the deposit was deemed to be "workable." In its decision the term "workable deposit" was defined in the following manner:

A deposit is determined to be "workable" when the value of the commodity is greater than the cost of extracting. Workability is only concerned with the economics of intrinsic factors involved in the development of the deposit and not extrinsic factors such as transportation, markets, etc., involved in the actual production and marketing of the commodity. See Elizabeth B. Archer et. al.,] 102 IBLA 308 (1988), United States Gypsum Co.,] 121 IBLA 174 (1991), and American Gilsonite Co.,] 111 IBLA 1 (1989).

BLM's decision was based on a formal mineral report (BLM Report) prepared by Denny R. Seymour, a BLM mining engineer, and Diane Groody, a BLM geologist. The authors describe the applied-for land in the following manner:

The subject lands are located in the northern portion of the Mt. St. Helens Mining District along the Green River and on the south slope of Goat Mountain one-half mile to the west of Ryan Lake and eleven and [one] half miles to the northeast of Mt. St. Helens. Three of the patents were issued prior to 1911 and two patents were issued in 1982 to the Duval Corporation based on their discovery and exploration of the Margaret Deposit during the 1970's. The Margaret Deposit is a major porphyry copper deposit suitable for mining as an open pit. Duval estimated the deposit to contain 577 million tons of 0.36% copper (Cu), 0.011% molybdenum (Mo), 0.007 oz/ton gold (Au), and 0.046 oz/ton silver (Ag) at a 0.33% Cu equivalent cutoff.

(BLM Report at 1).

During the 1970's, Duval Corporation was a major copper producer operating some of the lowest grade copper/molybdenum open pit mines in the United States. Both the U.S. Forest Service and BLM concluded that Duval had discovered a valuable mineral deposit and issued a mineral patent for a portion of the Margaret Deposit (Affidavit of Denny R. Seymour at 16). Duval's parent company, Pennzoil, elected to divest itself of hard mineral mining operations in 1984, and transferred Duval's patented and unpatented claims in the Mt. St. Helens Mining District to the Trust for Public Land (Trust). The Trust abandoned the unpatented claims in 1985 and conveyed the patented claims to the Forest Service (BLM Report at 5).

Using data from Duval's mine patent application files, the author(s) created a computer model of the deposit's recovered copper equivalent grade. The equivalent recovered grade was based on the estimated long-term metal prices of \$1.00/lb. Cu, \$3.50/lb. Mo, \$400.00/oz Au, and \$6.00/oz Ag (Spring 1990) and metal recoveries of 90% (Cu), 80% (Mo and Ag), and 50% (Au). To evaluate the economics of mining the higher grade portions of the deposit, three different "higher" grade open pits were delineated. In addition, Duval generated two different resource assessments for a 577 million ton reserve and a higher grade reserve containing 244 million tons. From these five development scenario's [sic] economic assessments were generated assuming various copper prices and mining rates for each scenario. The economic analyses were generated using the U.S. Bureau of Mines cost estimating procedures for unit mining costs, and Mining Cost Service's (Western Mine Engineering) cost models for unit milling costs and for capital costs for mine and mill. The resulting analyses indicate that at current long term market prices (1.10/lb. Cu) none is likely to generate a competitive rate of return on invested capital at copper prices of about \$1.25/lb. the pre-tax rates of return approach 15%. [sic] Duval's two development scenario's [sic] indicate that revenues exceed expected costs at current long term market prices of \$1.10/lb. Cu, \$3.15/lb. Mo, \$393.00/oz Au, and \$5.28/oz Ag (Fall 1991).

(BLM Report at 1).

The examining team's conclusion, set out in the BLM Report, was:

Based on the data available to the author(s) it is concluded that the lands applied for under prospecting permit application, OR 45170 (Wash), do not require prospecting and/or exploratory work to determine the existence and workability of the hardrock minerals which have been applied for. This conclusion is based on the economic models developed for this report for the Margaret deposit and the similarity of its reserve estimates to several major operating open pit mines with a similar range of operating conditions, locations, and geologic environments (Table #1 & Table #2). The "net dollars", shown in Table #2, is the sum of expected revenue less all project costs including pre-production, mine, mill, and smelter operating and initial capital costs. The test of workability is met for a given development scenario when a positive value occurs in the "Net" column of Table #2 for a copper price of \$1.10/lb. or less. None of the scenarios developed for this report denoted as BLMPPA (Bureau of Land Management Prospecting Permit Application) proved viable at price levels less than or equal to \$1.30/lb.. However, the scenarios which were developed based on Duval's reserve estimates generate positive Net values at \$1.10/lb. Cu for all projected mining rates except one. The return on capital (ROC) is the rate of return the scenario would generate on the initial capital investment with no taxes.

It appears that price levels of at least \$1.25/lb. to \$1.30/lb. are needed to justify commercial operations at current state of knowledge (or at least 15% ROC). At long term metal prices each percentage unit of molybdenum is equivalent to 2.86 percentage units of copper or approximately 1 to 3 (x% Mo = 3x% Cu). All of the mines in Table #1 have reserve grades comparable to Duval's reserve estimates. [Emphasis in original.]

(BLM Report at 2).

In its statement of reasons (SOR), Vanderbilt contends that the data used by BLM does not support a finding that the minerals on the land are workable, and that further exploration and prospecting is necessary. A mineral report based on existing data was prepared by Steffen, Robertson and Kirsten, Inc. (SRK). The SRK report was submitted in support of Vanderbilt's statement of reasons and its contention that existing data do not provide a reliable basis for classifying any mineral deposit in the applied-for area as workable.

Vanderbilt has requested a hearing before an Administrative Law Judge to permit it to offer evidence and cross-examine BLM employees. BLM opposes this request, contending that its study was based on the same factual data as that used by Vanderbilt, reducing the dispute to a difference of opinion among experts. BLM refers to our holding in American Gilsonite Co., 111 IBLA 1, 96 I.D. 408 (1989), that a mere difference of opinion among experts will not suffice to reverse a reasoned opinion rendered by the Secretary's technical staff.

Hearings are not a normal feature in the adjudication of cases such as this. E.g., United States Gypsum Co., 121 IBLA 174 (1991); American Gilsonite Co., 111 IBLA 1, 96 I.D. 408 (1989); A. J. Maurer, Jr., 106 IBLA 308 (1989); Earth Sciences, Inc., 80 IBLA 28 (1984); Christian F. Murer, 75 IBLA 232 (1983); John D. Archer, 75 IBLA 128 (1983); J. R. Simplot Co., 58 IBLA 305 (1981); Christian F. Murer, 57 IBLA 333 (1981); Philip Shaiman, 25 IBLA 271 (1976); William F. Martin, 24 IBLA 271 (1976); Powhattan Mining Co., 10 IBLA 308 (1973); William J. Colman, 9 IBLA 15 (1973); Lloyd K. Johnson, 8 IBLA 73 (1972); Clear Creek Inn Corp., 7 IBLA 200, 79 I.D. 571 (1972); J. D. Archer, 4 IBLA 323 (1972); J. D. Archer, 1 IBLA 26, 77 I.D. 124 (1970). The first hearing held in this type of case that we find was noted in James C. Goodwin, 9 IBLA 139, 143, 80 I.D. 7, 9 (1973). A hearing was ordered in Elizabeth B. Archer, 82 IBLA 14 (1984), and the result of that hearing was reviewed in Elizabeth B. Archer, 102 IBLA 308 (1988). 2/

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2/ When a mining claim is challenged for lack of discovery of valuable mineral (General Mining Law, 30 U.S.C. § 22 (1988)), a contest hearing is held pursuant to 5 U.S.C. § 554 (1988). The mining claim constitutes a property interest which cannot be invalidated on the basis of a disputed issue of fact without notice and an opportunity for a hearing. United States v. O'Leary, 63 I.D. 341 (1956). A hearing is not usually required

[3] The Board has discretionary authority to order a hearing before an Administrative Law Judge pursuant to 43 CFR 4.415, but will normally order a hearing only when it finds a material issue of fact that can only be resolved through the introduction of testimony and other evidence not readily obtainable through the ordinary appeal procedure. See United States v. Consolidated Mines & Smelting Co., 455 F.2d 432, 453 (9th Cir. 1971); Ben Cohen (Judicial Remand), 103 IBLA 316, 321, aff'd sub nom., Sahni v. Watt, Civ. No. S-83-96-HDM (D. Nev. Jan. 17, 1990), aff'd (Jan. 14, 1991); KernCo Drilling Co., 71 IBLA 53, 56 (1983). If no oral testimony is required and an appeal can be resolved relying on documentary submissions, a request for a hearing is properly denied. See R. A. Mikelson, 26 IBLA 1 (1976). In Ben Cohen, supra, we stated: "[T]o determine whether a material issue of fact exists, the Board first examines the legal principles which govern its consideration of an appeal on the basis of facts which are not in dispute. E.g., KernCo Drilling Co., [supra]."

Vanderbilt and BLM present their arguments as if prospecting permit denial must be based on a finding that a "reserve" exists on the land subject to the permit application. Concluding that the deposit is workable, BLM's Report states:

This conclusion is based on the economic models developed for this report for the Margaret deposit and the similarity of its reserve estimates to several major operating open pit mines with a similar range of operating conditions, locations, and geologic environments (Table #1 & Table #2). The "net dollars", shown in Table #2, is the sum of expected revenue less all project costs including pre-production, mine, mill, and smelter operating and initial capital costs. The test of workability is met for a given development scenario when a positive value occurs in the "Net" column of Table #2 for a copper price of \$1.10/lb. or less.

(BLM Report at 2).

Appellant also equates the workability test to a definition of a "reserve," as that term is defined by the Society for Mining, Metallurgy, and Exploration, Inc. (SME or Society) in A Guide for Reporting Exploration Information, Resources and Reserves, 43 Mining Engineering 379-84 (April 1991) (Exhibit C to the SRK report) (SRK Report at 21). It also bases its detailed objections to the sufficiency of BLM's data and analysis on these

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fn. 2 (continued)

for a "workability" determination, even though it involves similar issues, because a prospecting permit applicant gains no property right when filing an application, and there is no basis for asserting a due process requirement for a hearing and an opportunity to cross-examine. Christian F. Murer, 75 IBLA 232 (1983); John D. Archer, 75 IBLA 128 (1983); J. R. Simplot Co., 58 IBLA 305 (1981); Christian F. Murer, 57 IBLA 333 (1981); William F. Martin, 24 IBLA 271 (1976).

criteria, and consideration of appellant's arguments is facilitated by a brief discussion of mineral classification.

There is no firmly established or codified set of definitions of terms (standards) applied by the industry when classifying a mineral deposit. The term "reserves" is found to have differing meanings in different contexts. Terms with separate and distinct meaning are often used interchangeably and in inappropriate contexts. This often results in confusion regarding what was intended when the viability of a mineral property is discussed.

We find no decision setting out the relationship between statutory and regulatory standards such as "workability" and the concept of a "reserve" with the degree of precision Vanderbilt would apply. The SME committee report reflects an ongoing professional effort to develop more accurate and acceptable definitions. Before attempting to determine whether "reserve" and a "workable deposit" can be considered synonymous, we must define the term "reserve."

The Department has used similar definitions found in Principles of the Mineral Resources Classification System, Geological Survey Bulletin 1450-A (Bulletin) when classifying mineral deposits under other statutes. <sup>3/</sup> See, e.g., United States v. Feezor, 74 IBLA 56, 83-85, 90 I.D. 262, 277-78 (discussing relationship of reserve classification to issue of whether there was a discovery of a valuable mineral deposit under the mining laws). The Geological Survey (Survey) definitions define a "resource" as "a concentration of naturally occurring solid, liquid, or gaseous materials in or on the earth's crust in such form that economic extraction of a commodity is currently or potentially feasible." Bulletin at A2-A3. Two resource categories are given:

**Identified resources.**--Specific bodies of mineral-bearing material whose location, quality, and quantity are known from geologic evidence supported by engineering measurements with respect to the demonstrated category.

**Undiscovered resources.**--Unspecified bodies of mineral-bearing material surmised to exist on the basis of broad geologic knowledge and theory. [Bold in original.]

Id. at A3. <sup>4/</sup> The Survey description of a resource gives no suggestion that any given deposit will have economic value. The concept of economic value becomes applicable when the term "reserve" is employed. A "reserve" is "[t]hat portion of the identified resource from which a usable mineral and energy commodity can be economically and legally extracted at the time of determination." <sup>5/</sup> Vanderbilt contends that the value of the known copper

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<sup>3/</sup> The Survey definitions were used extensively prior to 1991, when the more precise SME definitions were published.

<sup>4/</sup> Undiscovered resources are further divided into hypothetical resources and speculative resources. Bulletin at A4.

<sup>5/</sup> Survey lists the following categories of identified resources that do not qualify as "reserves":

deposit is too low to permit economic extraction, the deposit cannot be called a reserve, and it is therefore not workable.

Using the approach adopted by both Survey and SME, deposits are classified on the basis of an increasing degree of geologic assurance and on the basis of an increasing degree of certainty regarding economic feasibility. Survey developed the following definitions, applicable to both identified-subeconomic resources and reserves:

**Measured.**--Reserves or resources for which tonnage is computed from dimensions revealed in outcrops, trenches, workings, and drill holes and for which the grade is computed from the results of detailed sampling. The sites for inspection, sampling, and measurement are spaced so closely and the geologic character is so well defined that size, shape, and mineral content are well established. The computed tonnage and grade are judged to be accurate within limits which are stated, and no such limit is judged to be different from the computed tonnage or grade by more than 20 percent.

**Indicated.**--Reserves or resources for which tonnage and grade are computed partly from specific measurements, samples, or production data and partly from projection for a reasonable distance on geologic evidence. The sites available for inspection, measurement, and sampling are too widely or otherwise inappropriately spaced to permit the mineral bodies to be outlined completely or the grade established throughout.

**Demonstrated.**--A collective term for the sum of measured and indicated reserves or resources.

**Inferred.**--Reserves or resources for which quantitative estimates are based largely on broad knowledge of the geologic character of the deposit and for which there are few, if any, samples or measurements. The estimates are based on an assumed continuity or repetition, of which there is geologic evidence; this evidence may include comparison with deposits of similar type. Bodies that are completely concealed may be included if there is specific geologic evidence of their presence. Estimates

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fn. 5 (continued)

**"Identified-Subeconomic.**--Resources that are not Reserves, but may become so as a result of changes in economic and legal conditions.

**"Paramarginal.**--The portion of Subeconomic Resources that (1) borders on being economically producible or (2) is not commercially available solely because of legal or political circumstances.

**"Submarginal.**--The portion of Subeconomic Resources which would require a substantially higher price (more than 1.5 times the price at the time of determination) or a major cost-reducing advance in technology."

Id. at 4 (bold in original).



of inferred reserves or resources should include a statement of the specific limits within which the inferred material may lie. [Bold in original.]

Bulletin at A3-A4.

It is not surprising that the SME terminology is similar to that previously developed by Survey. A major difference results from SME's having adopted "a sequential relationship between exploration information, resources and reserves." 43 Mining Engineering 379 (April 1991). Thus, SME begins its classification by examining the available physical information about a mineral deposit. The Society describes exploration information as: "[A]ctivities designed to locate economic deposits and to establish the size, composition, shape and grade of these deposits. Exploration methods include geological, geochemical, and geophysical surveys, drill holes, trial pits and surface and underground openings." Id. at 379-80. SME then offers the following definition of "resource:"

A concentration of naturally occurring solid, liquid or gaseous material in or on the Earth's crust in such form and amount that economic extraction of a commodity from the concentration is currently or potentially feasible. Location, grade, quality, and quantity are known or estimated from specific geological evidence. To reflect varying degrees of geological certainty, resources can be subdivided into measured, indicated, and inferred.

Id. The first sentence of the SME definition is the same as that developed by Survey. Survey included undiscovered "resources." SME excludes "undiscovered resources" in the last two sentences of its definition, characterizing that classification as "used by public planning agencies [but] not appropriate for use in commercial ventures." Id. at 379. Thus, the SME term "resource" is analogous to the Survey term "identified resource."

Survey and Society both divide resources into three classes: measured, indicated, and inferred. The SME defines these terms as:

**Measured.** Quantity is computed from dimensions revealed in outcrops, trenches, workings or drill holes; grade and (or) quality are computed from the result of detailed sampling. The sites for inspection, sampling and measurement are spaced so closely and the geological character is so well defined that size, shape, depth and mineral content of the resource are well established.

**Indicated.** Quantity and grade and (or) quality are computed from information similar to that used for measured resources, but the sites for inspection, sampling, and measurements are farther apart or are otherwise less adequately spaced. The degree of

assurance, although lower than that for measured resources, is high enough to assume geological continuity between points of observation.

**Inferred.** Estimates are based on geological evidence and assumed continuity in which there is less confidence than for measured and (or) indicated resources. Inferred resources may or may not be supported by samples or measurements but the inference must be supported by reasonable geo-scientific (geological geochemical, geophysical, or other) data. [Bold in original.]

Id. The SME definition of "measured" closely follows that of Survey, but Survey adds: "[T]he computed tonnage and grade are judged to be accurate within limits which are stated, and no such limit is judged to be different from the computed tonnage or grade by more than 20 percent."

The definitions of the term "indicated" differ in one respect worth noting. The Survey definition would allow a resource to be categorized as indicated when "the sites available for inspection, measurement, and sampling are too widely or otherwise inappropriately spaced to permit the mineral bodies to be outlined completely or the grade established throughout." SME allows that the points for inspection, sampling, and measurements are less adequately spaced than is required for a measured resource, but states that: "[T]he degree of assurance although lower than that for measured resources, is high enough to assume geological continuity between points of observation."

SME's definition of "inferred" is similar to, but may be considered more restrictive than Survey's. SME omits, for example, the following sentence that appears in Survey's definition: "[B]odies that are completely concealed may be included if there is specific geologic evidence of their presence." However, the language in the Survey's definition requiring "specific geologic evidence" of completely concealed bodies renders that definition very close to the SME definition.

SME's definition of "reserve" is more detailed than Survey's:

Reserve. A reserve is that part of the resource that meets minimum physical and chemical criteria related to the specified mining and production practices, including those for grade, quality, thickness and depth; and can be reasonably assumed to be economically and legally extracted or produced at the time of determination. The feasibility of the specified mining and production practices must have been demonstrated or can be reasonably assumed on the basis of tests and measurements. The term reserves need not signify that extraction facilities are in place and operative.

The term economics implies that profitable extraction or production under defined investment assumptions has been established or analytically demonstrated. The assumptions made must

be reasonable including assumptions concerning the prices and costs that will prevail during the life of the project.

The term legally does not imply that all permits needed for mining and processing have been obtained or that other legal issues have been completely resolved. However, for a reserve to exist, there should not be any significant uncertainty concerning issuance of these permits or resolution of legal issues. [Emphasis in original.]

Id. at 380. The two most significant differences between the SME and Survey definitions are: (1) SME limits the use of the terms "measured," "indicated," and "inferred" to resource determinations by eliminating the phrase "or reserve," making those terms applicable only to discussions of geologic assurance, and not applicable to economic viability; and (2) SME bases its categorization of "reserves" upon the category of the resource being considered during the course of economic viability examination. The second difference is apparent from the SME reserve classification:

**Proven reserve.** That part of a measured resource that satisfies the conditions to be classified as a reserve.

**Probable reserve.** That part of an indicated resource that satisfies the conditions to be classified as a reserve.

It should be stated whether the reserve estimate is of in place material or of recoverable material. Any in-place estimate should be qualified to show the anticipated losses resulting from mining methods and beneficiation or preparation. [Bold in original.]

Id. at 380. Under the Survey's definitions a mineral resource could be classified as an "inferred reserve." SME intentionally omitted the term "reserve" from its definitions of "measured," "indicated" and "inferred," and thus the "the terms "measured reserve," "indicated reserve" "inferred reserve" and "possible reserve" are not part of its classification scheme. The basis for this conclusion was that the use of these terms does not convey sufficient economic assurance to be reported as a reserve. See id. at 379.

Various statutes mandate the Department's classification of mineral deposits found in public lands and impose consideration of the economic value of a mineral resource. A mining claim must contain "a valuable mineral deposit" under 30 U.S.C. § 22 (1988), and the claimant desiring to exercise a property right must show evidence of mineral of such a character that a person of ordinary prudence would be justified in the further expenditure of his labor and means, with a reasonable prospect of success, in developing a valuable mine. Castle v. Womble, 19 L.D. 455 (1894), approved in Chrisman v. Miller, 197 U.S. 313, 322 (1905). Under United States v. Coleman, 390 U.S. 599 (1968), the prudent man test

includes evidence that the mineral in question can be presently extracted, removed, and marketed at a profit.

The term "reserve" is most often employed in mining claim contests. In United States v. Feezor, supra, the Board examined how that term related to the requirement for a discovery, and the extent geologic inference could be used when determining whether a mineral resource constituted a discovery supporting the validity of a mining claim. The definitions and classification described by Survey were used.

In United States v. Hooker, [48 IBLA 22 (1980)], the Board directly held that "indicated" reserves could be used to establish quantity and quality. Id. at 35-36; accord, United States v. Larsen, [9 IBLA 247, 261-63 (1973), aff'd, Larsen v. Morton, Civ. No. 73-19-TVC-JAW (D. Ariz. Oct. 24, 1974)]. The Board noted, however, that the question of whether "inferred" reserves could be utilized had yet to be determined. But see United States v. Wells, 11 IBLA 253, 258 (1973).

As noted above, demonstrated reserves (i.e., measured and indicated) can clearly be used to show the quantity necessary to establish a discovery. We do not however, believe that any such broad ruling can be made insofar as inferred reserves are concerned. To the extent that such an estimate is based on assumed continuity or repetition for which there is geologic evidence, we feel such a reserve base can properly be considered. Where, however, a body is completely concealed, so that its actual existence must be predicated on geologic inference, use of geologic inference would, in effect, substitute for the exposure of the mineral. Such an exposure, however, is a necessary precondition to a discovery. Therefore, an "inferred" reserve whose existence is dependent solely on geologic inference cannot serve as a predicate for finding quantity and quality sufficient to support a discovery. [Emphasis in original.]

United States v. Feezor, supra at 84-85, 90 I.D. at 278. Although SME considers an "inferred reserve" lacking "the requisite degree of assurance to be reported as a reserve," Feezor recognized that there may be circumstances in which an "inferred reserve" could be considered in support of a discovery finding.

"Locatable" minerals, such as copper, gold, and silver, are generally subject to appropriation under the general mining laws if found on public lands. 30 U.S.C. § 22 (1988). When these minerals are found on acquired lands, such as those involved in this case, they are not locatable, and the right to extract these minerals must be gained pursuant to the provisions of 43 CFR Subpart 3560. See 43 CFR 3560.3-1. A prospecting permit enabling the permittee to explore for hardrock minerals may be issued when prospecting or exploration is necessary to determine the existence or workability of a particular hardrock mineral deposit. 43 CFR 3560.1(a)). Permits are issued for an initial term of 2 years, and may be extended for a period not to exceed 4 years. See 43 CFR 3562.8-1; 3562.9. A permittee who discovers a valuable deposit may apply for a preference right lease. See 43 CFR 3563.2-1, 3563.1-2(b).

When a party seeks minerals in acquired Federal lands there are several advantages gained by obtaining a prospecting permit. The rental during the initial period is lower than for leases, the permittee does not have to make a competitive bid for a lease if a valuable mineral deposit is discovered, and a prospecting permit allows mineral exploration for up to 6 years without the production and royalty requirements. In Yankee Gulch Joint Venture, 113 IBLA 106, 130-31 (1990) we held that the test used when determining whether a prospecting permit holder has discovered a valuable deposit warranting issuance of a preference right lease is almost identical to the test used when determining whether a mining claimant has discovered a valuable mineral deposit.

Although the "discovery" test may appear similar to the "workability" test, they are not the same. 6/ Under both tests there must be mineral of sufficient value to recover direct costs. Both recognize a distinction between "exploration" and "development." However, there are two significant differences. First, costs other than direct costs (such as transportation and marketing costs) are not included when making a workability determination but are included when considering whether there is a discovery. Second, a more liberal reliance on geologic inference is allowed when applying the "workability" test. 7/

In Atlas Corp., 74 I.D. 76, 79 (1967), the Department considered the relationship of these requirements in an appeal from a denial of a phosphate prospecting permit application. Atlas contended that the workability determination should be based upon "actual knowledge," i.e., geologic information gained by physical examination of the deposit within the applied for tracts by drilling or similar on the ground exploration methods, rather than through geologic inference. The decision traced the concept of workability for coal prospecting permits, and, citing Emmett K. Olson, 48 L.D. 29 (1921), concluded:

This long continued administrative and judicial interpretation, and its recognition by Congress, is persuasive that competent evidence to establish the fact that land contains valuable deposits of certain minerals, that it is known to be valuable for minerals, that it contains commercially valuable deposits of minerals, or that exploration is not necessary to

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6/ If the meanings were identical, one seeking to develop a deposit could obtain a prospecting permit when exploratory work would not disclose the existence or workability of a valuable deposit by presenting evidence that a known deposit was submarginal and thus would not support a "discovery." 7/ For example, a "workability" finding for some bedded minerals has been based solely on geologic inference drawn from exposures on adjacent lands. Christian F. Murer, 75 IBLA 232 (1983); Atlas Corp., 74 I.D. 76 (1967).

determine the existence or workability of a coal or phosphate deposit, may consist of proof of the existence of the minerals in adjacent lands and of geological and other surrounding and external conditions. On the other hand, it is not necessary, as Atlas insists, to demonstrate the workability of the mineral deposit from an actual physical examination of the deposit in the land applied for by means of drilling or actual exploratory work on the ground.

Atlas Corp., *supra* at 84-85.

It was also noted, however, that "the character of phosphate deposits, which occur with great uniformity of thickness and consistency of quality throughout wide areas, is most similar to coal deposits." *Id.* at 82 n.3. Total reliance upon geologic inference may not be appropriate for other mineral deposits, such as copper, which are not typically uniform in either thickness or grade. However, if a sound basis for the inference can be demonstrated, that inference may be used. Because greater latitude in the use of geologic inference is permitted when making the workability test, it follows that evidence justifying a discovery will justify a determination that the deposit is workable. *Cf. United States v. Feezor*, *supra* (use of geologic inference for copper deposit under discovery test).

The economic component of the workability test is also different. In *James C. Goodwin*, 9 IBLA 139, 156-57, 80 I.D. 7, 15-16 (1973), we considered economic factors applicable to workability:

Workability as defined by the USGS is concerned with the economics of the intrinsic factors. Extrinsic factors such as transportation, markets, etc., are not considered. However, the cost of mining must be considered. In its classification of coal lands, USGS has anticipated and assumed the ultimate coming of conditions favorable for mining and marketing of any coal if the coal is workable in terms of the intrinsic factors. In this respect, the test of workability under the Mineral Leasing Act differs from the prudent man rule under the mining laws.

A further differentiation from the "prudent man" requirement of "a reasonable prospect of success" was made in *Atlas Corporation*, 74 I.D. 76, 84 (1967).

\* \* \* [I]t is not necessary, in order to sustain a finding that such deposits do exist in workable quantity, that a determination can be made with some degree of assurance that a mining operation will be an economic success. Rather, it is enough that the available data is sufficient to determine that the lands under consideration would require only limited prospecting to project a program for development but

would not require prospecting for the purpose of determining the presence of workability of the deposit. [Emphasis supplied.]

Id. at 156-57, 80 I.D. at 15-16 (emphasis supplied in Atlas Corp.).

A mining claimant must show that, as a present fact, its deposit can be extracted, removed, and marketed at a profit. In Re Pacific Coast Molybdenum, Co., 75 IBLA 16, 29, 90 I.D. 352, 360 (1983); see United States v. Coleman, 390 U.S. 599, 600, 602 (1968).

Thus a showing that further information would render the workability determination more accurate is not sufficient to mandate that a decision denying a prospecting permit be vacated or reversed. The concept of workability is used to distinguish between the body of evidence which indicates that a valuable mineral deposit might be disclosed by further exploration and sufficient evidence of the existence of a mineral deposit to justify competitive bidding for the right to acquire a mineral lease. The prospecting permit is a grant of a right to explore for an undisclosed or insufficiently disclosed deposit of mineral with the exclusive right to a lease if the exploration is successful. To hold otherwise would foster the use of prospecting permits as a device for holding known but submarginal mineral deposits in anticipation of improved economic conditions. 8/

[4] By asserting that the data used by BLM was insufficient to support its finding that the deposit was workable, appellants have raised an issue of fact, but not necessarily a relevant one. Although the statement of the test for "workability" in BLM's decision might be satisfied only by a proven or probable reserve, using the SME definitions, or a measured or indicated reserve using the Survey's definitions, our analysis of decisions addressing the meaning of "workability" confirms the propriety of using inferred and subeconomic mineral resources as a basis for finding a deposit "workable," however those resources might be defined. Thus a deposit not qualifying as a "reserve" can, none the less, be classified as "workable." However, it remains proper to consider Vanderbilt's arguments to determine whether BLM's rejection of the prospecting permit application is supported by the facts.

Vanderbilt enumerates eight criticisms of BLM's report:

1. The BLM report considered the data from 70 exploration drill holes which were drilled on both the northern and southern portions of the property. The exploration drilling conducted to date and the information available from that drilling is simply inadequate to identify the presence of a workable deposit under the lands subject to the Permit Application.

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8/ It is conceivable that the Department may prematurely deem a deposit worthy of competitive leasing. In such cases it can be expected that either no bids will be submitted or that a lease will be issued and subsequently allowed to terminate. In either event, the land will subsequently be available and the need for further exploration can be reevaluated. Present public policy favors competitive bidding over prospecting permit issuance when a deposit is known to exist.

2. Although the BLM report includes a geologic review, no geologic or statistical boundaries were placed on the grade estimations made by BLM. The failure to define the boundaries to the grade estimations allows higher grade samples to erroneously influence grade estimation in blocks beyond the reasonable geologic or statistical boundaries.

3. In determining the workability of the lands subject to the Prospecting Permit, BLM used a method of determining mineral values which included copper equivalent values. The BLM method erroneously incorporates the assumption of a correlation of the grades of molybdenum and gold to the grade of copper. The statistical analysis of the drill hole data performed by SRK clearly shows that there is no correlation between the grades of molybdenum or gold and copper. SRK Report, figures 3.1 and 3.2. The method employed by BLM to determine copper equivalent values estimates block equivalent values which have little or no relationship to the actual grades of molybdenum and gold within the blocks. The copper equivalent values can be properly estimated by determining the block grades for each element. The block grades for each mineral must then be combined to calculate a copper equivalent.

4. The inverse distance (squared) method used by BLM was inadequately applied. The BLM method did not properly incorporate a statistical analysis of the dataset as a whole with data sub-setted by rock types to determine the relationship of mineral grade distribution and geology, did not properly consider geology in the determination of samples upon which the to [sic] based estimated mineral grades for each rock type so as to prevent higher grade samples from unduly influencing large volumes of lower grade rock, did not incorporate geostatistical analysis to determine three-dimensionally the various grades for each of copper, gold and molybdenum, and did not apply three-dimensional grade distribution models to the estimation through the use of defined anisotropy.

5. The BLM's reliance upon 250 meters for the range of estimation influence is excessive. The SRK geostatistical analysis indicates that this range is excessive by 37%.

6. The inverse distance (squared) method utilized by BLM does not adequately calculate the errors inherent in the estimation. Accordingly, the inverse distance (squared) method cannot be used to determine the confidence which can be placed upon the grade estimate for each block. In contrast, Kriging techniques calculate the actual estimation errors for each block while minimizing such errors.

7. The BLM model utilized only composites from the bench for which the estimate was made and from the benches immediately



above and below the studied bench resulting in a pancake-shaped pseudo-anisotropy 500 meters in diameter and 50 meters in thickness. There is no data or analysis in the BLM report to support this.

8. The BLM report does not include a pit optimization analysis which is essential to the determination of actual costs of mining.

As noted previously, SRK was retained to review existing drill hole data and evaluate the property's mineral potential. In SRK's report, which was used as the basis for the eight objections, it summarized its findings:

The review included geologic modeling, statistical and geostatistical analysis, economic modeling and pit optimization. The property was shown to have two distinct geochemical populations. One population had Cu grades ranging from 0.15 to 0.75% and the other had Cu grades greater than 0.75% Cu. The lack of geochemical data for block model grade estimation limited SRK's ability to develop a model which focused on the southern portion of the property where drilling was more closely spaced. Even this area of the property showed very high (30-80%) relative errors in the estimated block grade values, reflecting the quantitative deficiency of the data available.

The resources totaled 180.68 million tons at average grades of 0.324% Cu, 0.0125% Mo and 0.006 oz/ton Au. Seventy percent of this resource is classified as inferred and the remaining is classified as indicated (SME, 1991 - Appendix C). Application of economic costs and values to the resource indicated the optimum pit would contain 77 million tons of ore with a NPV of -191 million dollars. These results show the existing data do not indicate the existence of a workable resource on the property.

A review of a 1991 BLM study on the property indicated similar conclusions were reached by the BLM despite some flaws in the modeling techniques used. Applying the most optimistic costs used on the property to date (Duval, 1980) to our grade model, the property was still shown to be unworkable with an adjusted cash flow of -181 million dollars.

Further exploration work is essential to discover heretofore unidentified resources before any prospect of a workable property is possible. Exploration work should include mapping, sampling and drilling. Until such time as further resources are discovered, it would be inappropriate to perform any further resource evaluation or prefeasibility studies.

On July 13, 1992, Vanderbilt and Teck filed another request for a hearing. By order dated July 16, 1992, we directed them to show cause why their request should not be denied by identifying the question or

questions of fact to be specified in any order sending the case for hearing. They replied, setting forth the following issues:

1. The sufficiency of the geologic data on which BLM based its report.
2. The necessity of applying geologic or statistical boundaries for the mineral deposit and its grade.
3. The propriety of including copper equivalent values based upon the assumption of a correlation of the grades of other minerals on which the copper equivalent values are based to the grade of copper throughout the deposit.
4. The propriety and accuracy of the statistical methods used by BLM in its calculations.
5. The failure of BLM to include a pit optimization analysis in its determination of the actual cost of mining.

In its answer, BLM states that appellants' analysis "presents a unnecessarily narrow interpretation of the known information concerning the available resource," and that it is prepared to show that "limited changes in several of the variables involved will easily throw the analysis of the appellant over the line which separates a workable from an unworkable deposit" (BLM Answer at 4-5). Denny Seymour, BLM's mining engineer, reviewed the SRK report and the additional material provided by Vanderbilt. Seymour summarizes his analysis and conclusions in an affidavit attached to BLM's answer.

Seymour studied the plots of the Vanderbilt mineralized block model and concluded that Vanderbilt used less than 52 percent of the available samples with significant mineralization when estimating the available resource. Seymour also disagreed with Vanderbilt's use of a \$1 per pound copper price, restating the basis for BLM's use of the 5-year average copper price of \$1.10 per pound.<sup>9/</sup> In mining claim validity cases we have held that historic mineral values should be considered to compensate for market fluctuation. In Re Pacific Coast Molybdenum, Co., 75 IBLA at 28-29, 90 I.D. at 359-60. For example, in United States v. Crowley, 124 IBLA 374 (1992), we accepted the use of 5-year average prices for convenience. BLM admits that no profit can be shown using \$1.10 per pound. However, this fact does not, per se, justify the issuance of a prospecting permit for further exploration of the deposit. The basis for BLM's holding that no further prospecting is needed is its determination that the workability of the deposit is controlled by market price, a factor which will not be altered by further prospecting.

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<sup>9/</sup> In the last 5 years the value of copper has been as high as \$1.50 per pound, but its 5-year average is at \$1.10 per pound.

Seymour presented four case studies based on SRK's analysis to demonstrate how close SRK's analysis is to showing the existence of a reserve 10/ (Affidavit at 13-14). The first study shows the deposit to be unworkable using SRK's assumptions, with a negative net value of over \$40 million. In the second study Seymour revised capital costs for a 40,000 ton per day operation, using a 50,000 ton per day operation. Under this scenario, revenues would exceed costs by \$15.1 million. In the third scenario he retained values used in the second scenario and revised the price of copper to \$1.10 per pound. This increased projected net revenues to \$126.3 million. Seymour's final study retained the values used in case three and updated unit mining and milling operating costs for a 40,000 ton per day operation. This resulted in reduced mining cost, increased milling cost, and net revenues of \$50.8 million.

As we stated earlier, a prospecting permit may be issued when further exploration is needed to disclose a workable deposit. However, when a deposit is not workable, as appellant contends, that fact may be attributed to economic conditions rather than a insufficient knowledge regarding the anticipated size and/or grade of a mineral deposit. Vanderbilt's own analysis suggests that prospecting would not provide significant additional information which would significantly alter either the size or grade of the deposit. Thus, Vanderbilt has raised an issue of fact as to whether a reserve exists, but its submissions cannot be taken as an offer of proof that the deposit could be rendered workable by further prospecting.

BLM's answer also addressed the eight contentions Vanderbilt raised in its SOR. In response to Vanderbilt's first two contentions (the adequacy of the drill hole information BLM relied upon and BLM failure to define the geologic or statistical boundaries for its grade estimates) BLM explains that two estimates were made. Its second was based on a maximum horizontal drill hole sample value projection of 125 meters (not 250 meters). BLM also states that it found a good correlation between its geologic interpretation of the mineralized zones and Duval's. BLM states that porphyry copper deposits are relatively continuous, with a 300- to 600-foot zone of influence not being unusual, and that its use of a 125 meter zone of influence was reasonable.

Vanderbilt's third objection was to BLM's use of "copper equivalent values," which added the value of other recoverable metals. It contends that this method erroneously incorporates an assumed correlation between the contained molybdenum and gold and contained copper. BLM responds that it did not make a correlation assumption, but used the metal content reported by Duval, and that when an assay report did not list a specific metal (more likely a failure to assay for that metal than its absence) no additional value was attributed for that metal. According to BLM, this approach will usually cause the metal content to be underestimated.

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10/ None of Seymour's case studies takes into account BLM's conclusion that there is substantially more recoverable mineral material than was projected by Vanderbilt or SRK's not having considered recovery of silver values.

Vanderbilt's fourth objection relates to its contention that BLM did not consider rock type distribution when making its analysis. BLM responds that during its examination it used the geologic information available to it at the time of the examination.

The fifth objection was to BLM's use of a 250 meter radius for its zone of influence. However, this radius was used for the first BLM estimate, made in 1990, not the second, which used a 125-meter radius. In response to Vanderbilt's seventh objection, that BLM's used a "pancake-shaped pseudo-anisotropy of 500 meters in diameter and 50 meters in thickness," BLM states that this criticism was directed at its 1990 resource estimate, not the 1991 estimate which employed a 125 meter search radius and a 250 meter pseudo-anisotropy diameter.

Vanderbilt's sixth objection relates to its contention that BLM did not properly apply the "inverse distance (squared) method" when making its analysis because it failed to adequately calculate the errors inherent in its estimation. It contends that Kriging techniques should have been employed to calculate the actual estimation errors for each block, minimizing these inherent errors. BLM states that, like polygon and Kriging methods, the "inverse distance squared method" is accepted in the industry. It notes that estimates using the polygon and Kriging methods involve many more hours of computer computation time, and argues that, although Kriging may be superior when developing a specific mine plan, the same degree of specificity is not required for a workability determination.

In response to Vanderbilt's eighth objection (that BLM failed to include a pit optimization analysis) BLM admits that a pit optimization analysis would be helpful, but states that it is not necessary to make this analysis when determining workability. BLM states: "Again it appears that the appellant is attempting to require the BLM to complete the type of detailed and expensive analysis that a mining company might undertake to determine exactly how it would go about developing a mineral resource" (BLM Answer at 14).

When considering what evidentiary burden should be placed upon BLM in a case such as this, it is proper to weigh that burden against the nature of the appellant's interest, and the risk that an appellant would be improperly deprived of that interest if the greater burden were not placed on BLM. <sup>11/</sup> BLM is not required to sustain its

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<sup>11/</sup> See footnote 2, *supra*. When procedural due process is required, a balancing of interest test is used for determining the "specific dictates" of due process: First the private interest that will be affected by the official action; second, the risk of an erroneous deprivation of such interest through the procedures used, and the probable value, if any, of additional or substitute procedural safeguards; and finally, the Government's interest, including the function involved and the fiscal and administrative burdens that the additional or substitute procedural requirement

"workability" determinations with the same quantum of evidence needed to sustain a finding that there is a "discovery." For example, physical examination of the land is unnecessary when considering an application, if the land has been classified. Christian F. Murer, 57 IBLA 333 (1981); William J. Coleman, 9 IBLA 15 (1973); J. D. Archer, 1 IBLA 26, 77 I.D. 24 (1970). When reviewing the exercise of discretionary authority to issue or deny a prospecting permit, a primary consideration is the undisputable fact that a prospecting permit applicant holds an expectancy and not an interest in the land. Thus, this balance weighs heavily against finding error because BLM failed to conduct Kriging and pit optimization analyses. There is no showing that BLM could not properly reach its conclusion without making those analyses.

Earlier in this decision, we noted that a hearing would be appropriate if there is a material issue of fact requiring introduction of testimony and other evidence. Each of the issues identified by appellant in response to our July 16, 1992, order is predicated on an incorrect understanding of the legal basis for a decision to reject a prospecting permit application. When the legal basis for the determination is clarified no material issues of fact remain. Given the discretionary nature of a decision to accept or reject a prospecting permit application, the wider scope of geologic inference allowed when determining workability, and the ability to reject a prospecting permit application for an unworkable deposit if it would be unlikely that further prospecting would establish workability, the material submitted by appellant sustains a finding that the rejection of its prospecting permit application was not arbitrary or capricious, and that the decision is supported by the record.

Therefore, pursuant to the authority delegated to the Board of Land Appeals by the Secretary of the Interior, 43 CFR 4.1, the appellant's request for a hearing is denied and the decision appealed from is affirmed as modified.

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R. W. Mullen  
Administrative Judge

I concur:

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John H. Kelly  
Administrative Judge

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fn. 11 (continued)

would entail. Mathews v. Eldridge, 424 U.S. 319, 335 (1976). Although Vanderbilt would like to cross-examine BLM employees making the recommendation in this case, a proper application of this balancing test makes cross-examination unnecessary. BLM will satisfy its obligation if it issues a reasoned opinion which is supported by the record.